

CLAIMS

1. A catalyst containing at least one group VIII element and at least molybdenum and/or tungsten, said elements being present at least in part in the catalyst in the dry state in the form of at least one heteropolyanion with structural formula $M_xAB_6O_{24}H_{6C(3-2x)}tH_2O$ (I); $M_xAB_6O_{24}H_{6C(4-2x)}tH_2O$ (I'); $M_xA_2B_{10}O_{38}H_{4C(6-2x)}tH_2O$ (I''); $M_xA_2B_{10}O_{38}H_{4C(8-2x)}tH_2O$ (I'''); or $M_xA_2B_{10}O_{38}H_{4C(7-2x)}tH_2O$ (I''''), in which M is cobalt and/or nickel and/or iron and/or copper and/or zinc, A is one element from group VIII of the periodic table for formulae I and I' or 1 or 2 elements from group VIII of the periodic table for formulae I'', I''' and I'''', B is molybdenum and/or tungsten and C is an H^+ ion and/or a $(NR_1R_2R_3R_4)^+$ type ammonium ion, in which R_1 , R_2 , R_3 and R_4 , which may be identical or different, correspond either to a hydrogen atom or to an alkyl group, and/or caesium and/or potassium and/or sodium, t is a number between 0 and 15 and x takes a value in the range 0 to 3/2 in (I), a value in the range 0 to 2 in (I'), a value in the range 0 to 3 in (I''), a value in the range 0 to 4 in (I''') and a value in the range 0 to 7/2 in (I''''), and in which the number of bonds connecting the group VIII element or elements with the molybdenum and/or tungsten with a length of 3.6 angstroms or less is strictly greater than 2.
2. A catalyst according to claim 1, in which more than 2 bonds connecting the group VIII element or elements with the molybdenum and/or tungsten have a length of 3.5 angstroms or less in the catalyst in the dry state.
3. A catalyst according to claim 1 or claim 2, in which element A is selected from the group constituted by nickel, cobalt and iron.
4. A catalyst according to one of claims 1 to 3 comprising, in the dry state, 0.01% to 100% by weight with respect to the total catalyst weight of at least one heteropolyanion with a structural formula selected from the group constituted by formulae I, I', I'', I''' and I''''.
5. A catalyst according to one of claims 1 to 4, comprising at least one porous mineral matrix.
6. A catalyst according to claim 5, comprising a zeolitic molecular sieve.
7. A catalyst according to claim 5 or claim 6 comprising, in the dry state, as a % by weight with respect to the total catalyst weight, 1% to 99.9% of at least one porous

mineral matrix, 0.1% to 99% by weight of at least one heteropolyanion having a structural formula selected from the group constituted by formulae I, I', I'', I''' and I'''' and 0 to 80% by weight of at least one zeolitic molecular sieve.

8. A catalyst according to one of claims 1 to 7, in which the heteropolyanion has a structural formula selected from the group constituted by $\text{Co}_2\text{Mo}_{10}\text{O}_{38}\text{H}_4\text{Co}_3$, $\text{CoMo}_6\text{O}_{24}\text{H}_6\text{Ni}_{3/2}$, $\text{CoMo}_6\text{O}_{24}\text{H}_6\text{Co}_2$, $\text{Co}_2\text{Mo}_{10}\text{O}_{38}\text{H}_4\text{Ni}_3$, $\text{Ni}_2\text{Mo}_{10}\text{O}_{38}\text{H}_4\text{Co}_4$, $\text{NiMo}_6\text{O}_{24}\text{H}_6\text{Co}_2$, $\text{CoMo}_6\text{O}_{24}\text{H}_6\text{Ni}_2$, $\text{CoMo}_6\text{O}_{24}\text{H}_6\text{Co}_{3/2}$, $\text{NiMo}_6\text{O}_{24}\text{H}_6\text{Ni}_2$.
9. A catalyst according to one of claims 1 to 8, which has undergone a sulphurization treatment.
10. Use of a catalyst according to one of claims 1 to 9 in processes for hydrorefining and/or hydroconverting hydrocarbon feeds.
11. Use according to claim 10 in hydrogenation, hydrodenitrogenation, hydrodeoxygenation, hydrodearomatization, hydrodesulphurization, hydrodemetallization, hydroisomerization, hydrodealkylation or dehydrogenation reactions.
12. Use of a catalyst according to one of claims 1 to 9 in hydrocracking hydrocarbon feeds.
13. Use according to one of claims 10 to 12, in which said hydrocarbon feeds contain at least one heteroatom.